

WHAT IS CLAIMED IS:

1. A method for prolonging peak in-cylinder pressure in a diesel comprising:

a) injecting fuel into a cylinder during a compression upstroke of a piston that reciprocates within the cylinder and creating pressure sufficient to initiate combustion of the injected fuel, and

b) as the fuel is combusting, injecting more fuel at a controlled rate of injection to cause further combustion of fuel in a manner that upon substantially peak in-cylinder pressure being attained is effective to prolong that peak in-cylinder pressure such that a trace of pressure vs. crank angle would contain a distinct plateau representing the prolonged peak pressure, wherein

c) the combined injections of a) and b) comprise at least two discrete injection pulses.

2. A method as set forth in Claim 1 wherein step a) is performed by at least one of the discrete injection pulses that begins and ends before top dead center in the engine cycle and step b) is performed by another of the discrete injection pulses that begins before top dead center and ends after top dead center.

3. A method as set forth in Claim 1 wherein steps a) and b) are collectively effective to advance the timing of peak pressure such that the peak pressure is achieved slightly before top dead center in the engine cycle.

4. A diesel engine comprising:

a) multiple cylinders into which a fueling system injects fuel during engine cycles; and

b) an engine control system that controls the fueling system and causes the fueling system to inject fuel into each cylinder during a compression upstroke of a respective piston that reciprocates within the respective cylinder so that combustion of the injected fuel will be initiated by in-cylinder pressure created by the upstroking piston, and as the fuel is combusting, injects more fuel at a controlled rate of injection to cause further combustion of fuel in a manner that upon substantially peak in-cylinder pressure being attained is effective to prolong that peak in-cylinder pressure such that a trace of pressure vs. crank angle would contain a distinct plateau representing the prolonged peak pressure, wherein

c) the combined injections of a) and b) comprise at least two discrete injection pulses.

5. A diesel engine as set forth in Claim 4 wherein at least one of the discrete injection pulses begins and ends before top dead center in the engine cycle and another of the discrete injection pulses begins before top dead center and ends after top dead center.

6. A diesel engine as set forth in Claim 4 wherein the discrete injection pulses are collectively effective to advance the timing of peak pressure such that the peak pressure is achieved slightly before top dead center in the engine cycle.